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THE EMPIRICAL STATUS OF GEOMETRICAL ENTITIES

CONCERNING the difference between concepts and percepts, philosophers are widely agreed. Since Socrates there has been but one verdict whenever men have asked whether concepts are perceptible. They will all tell you that there are profound and ineliminable differences between cognizing justice and noting the crow in yonder tree. The entities known through reflection are not those discerned with mere eyes and ears. Knowledge is radically unlike perception. An idea is not a percept.

Now, I would not criticize here this psychological dualism in general. I wish only to lay bare one particular error which it has engendered and one fallacy by which men have argued themselves into that error. This error is the one of supposing that the concepts of pure geometry can not be found in the realm of percepts. And the fallacy leading to the error is a complex variety of the fallacy of accident; a variety so distinct and so dangerous that it deserves a brand of its own.

While the proofs of the points I am about to make are not sufficient to disprove the psychological dualism out of which the error and fallacy arise, nevertheless they must bring this hypothesis under fresh suspicion.

A defender of the psychological dualism might consistently accept the perceptibility of geometry's ideas and retain his faith in his hypothesis; he could do so by declaring that, although he had supposed those entities to be concepts, they turn out to be percepts. But I fancy that few persons would be willing to take refuge in this opinion; for it is just such ideas as those of geometry (and mathematics) which Plato and nearly everybody else have regarded as most obviously conceptual. They seem to be "pure ideas." In them is no taint of the tangible nor of the visible. If, then, we can show the perceptibility of even one of them, grave doubt will be cast upon the conceptual status of all others.

A Specimen of the Fallacy.—Although the fallacy I am about to describe is committed by many thinkers of much higher philosophical skill and repute than Karl Pearson, I prefer to cite this gentleman's use of it. Pearson's bad reasoning is so bold and undisguised that any undergraduate who scans may penetrate its errors. One of the numerous passages in "The Grammar of Science" flaunting this particular fallacy occurs in the chapter on space and time. Here Pearson undertakes to prove, from a well-known fact about the "inaccuracies of perception," that conceptual space is a "purely ideal limit of a process begun in perception" and hence is "only an ideal symbol," a "scientific short-hand" whose validity lies only in "the power it gives us of codifying past and predicting future experience." The fact he employs is this:

"The geometrical ideas of line and plane involve absolute sameness in all their elements and absolute continuity. . . . But do we experience anything like these in our perceptions? The fly-leaf of this book appears at first sight a plane surface bounded by a straight line, but a very slight inspection with a magnifying lens shows that the surface has hollows and elevations in it. . . . However great care we take in the preparation of a plane surface, either a microscope or other means can be found of sufficient power to show that it is not a plane surface. It is precisely the same with a straight line. . . . Our experience gives us no reason to suppose that with any amount of care we could obtain a perceptual straight line or plane, the elements of which would on indefinite magnification satisfy the condition of ultimate sameness involved in the geometrical definitions. We are thus forced to conclude that the geometrical definitions are the results of processes which may be started, but the limits of which can never be reached in perception; they are pure conceptions having no correspondence with any possible perceptual experience."

The Misinterpretation of Geometry Underlying this Argument.—Here is an argument which is as simple and as plausible as it is familiar. It is, however, wholly dependent upon a very loose interpretation of the geometrical definitions which it contrasts with percepts. And this same laxity smuggles into the definitions a meaning utterly foreign to them and to the intent of the geometer. To be specific, Pearson misconstrues "absolute" in the definition of the straight line. He takes it to mean "invariable in all *physical* relations." But, to the geometer who never employs the adjective technically as a description of figures, it carries only the colloquial meaning of "perfect." Now, to what does this perfection refer? I think there can be no doubt as to what reply the geometer would make to the question. He certainly would say that a line or other figure is "absolute" or "perfect" *if it fulfills its definition.* To put his case still more sharply, he would say that an "absolute" quality of a straight line, in his science, is merely a precise relation of agree-

ment between something that is described or defined and the specifications included in the definition; it is not necessarily a quality which the object displaying it always possesses under all conditions.

When he speaks of the straight line as having all its elements "absolutely" the same and continuous, does he allege that there is, *in nature,* an object which, however magnified to the eye, will always *look* continuous and homogeneous? Certainly, he does not. On the contrary, he says only that, *wherever* you find an object which is continuous and homogeneous in the manner named, *there* you have what he terms a straight line. Please emphasize "wherever" and "there"! The careful speaker, in geometry, does not use these words; instead, he says "if" and "then." He says: "I shall define a straight line as one which is continuous, homogeneous, etc." And then he goes on with his geometrical reasoning: "Whenever I have a straight line, I can do thus and so with it; it has these peculiarities. And so on." Not once does it occur to him to ask whether this object might be *approached* or *manipulated* in such a manner as to be changed from a straight line into a crooked or a broken one. In this respect he does as anybody else does when engaged in analysis. The chemist who is analyzing a poison does not ask nor care whether the stuff might be a food under some circumstances. He does not even ask whether the atoms of the poison may not "really" be ether whorls. As soon as he asks this question, he passes beyond analysis. It may be a very useful question to ask, but it raises new issues; and nothing discovered in connection with these new issues can alter the facts of pure analysis.

The geometer defines a straight line as continuous and homogeneous, but he does not say anything whatever about the conditions of its existence in nature *nor about its looking the same from every point of view.* There is absolutely nothing in his definitions nor in their implications which necessitates his forming any opinion whatever about the invariable appearance of the real line under all circumstances. He does not feel obliged to say that, because a three-inch straight line looks shorter, when viewed from a distance, therefore it is not really a three-inch line, in the sense of the original definition (which, of course, is the only sense permissible). Why, then, should he admit to the philosopher that the line is only an "ideal construct," inasmuch as it changes its appearance as you draw nearer to it and magnify it? No such concession can be wrung from the geometrical definitions themselves; for all they state is that a homogeneous continuum of one dimension shall be designated a straight line. But where shall we find such a continuum? Geometry is silent. Is it impossible that such a continuum display its peculiarities under some circumstances and not under others? Again, no

word from geometry. One might as well ask of it whether straight lines may not be green as well as red, or curves used in frescoes as well as in engineering.

Now, please observe carefully the implications of the geometer's own definition and its restrictions. "*If* continuous and homogeneous," says he, "*then* a straight line." If this be the definition, and if it be taken without any spurious interpretations, then we must say that, *whenever a line is seen as homogeneous and continuous, then it is a perceived straight line.* In other words, if I observe a line devoid of every heterogeneity and break, then I perceive precisely what the geometer means by a straight line. I find no logical escape from this conclusion. For to put it in syllogistic form,

1. A homogeneous continuum of one dimension is a straight line.
2. I see a homogeneous continuum of one dimension (*e. g.*, the ridge line of a distant house against the sky).
3. Therefore, I see a straight line.

This conclusion is in no wise vitiated by the fact that, *under some conditions of existence in the physical world,* a physical object which exhibits geometrical straightness may be viewed or manipulated so as to lose its straightness *under the new conditions.* The above syllogism can be rejected only by reading into the definition of the straight line certain qualifications which the geometer rejects, namely, the invariability of a *physical* straight line under *all* possible conditions. This qualification the geometer can not make without altering his purpose and his methods of investigation. Furthermore, it would be a gratuitous assumption which a very little research would quickly prove absurd.

The Fallacy of Manipulating the Object.—The fallacy we are now interested in may be placed in contrast with the above syllogism. Pearson reasons as follows:

1. A line is absolutely straight only if straight in every relation.
2. The line I perceive as straight is straight only in this and a few other similar relations.
3. Hence it is not absolutely straight: and so does not fulfill the geometrical definition.

The experimental method of establishing this conclusion is as we find it in the passage already cited from Pearson. You choose any object about which you wish to prove your point; you bring it into various new relations; you note that it now differs in some manner from its condition in the original relation wherein you found it; and now you are ready to infer—what? That there is a concomitant variation of characters and relations? No! You infer rather that the *original* character was not a genuine character of the object

under investigation. The presupposition of this last statement is the major premise of Pearson's syllogism, above formulated.

Apply this argument, as Pearson does, to the geometrical straight line, and you have the following train of thought: "Straightness is the quality of a certain line; the quality is *in* the line; hence, if you find in nature a line which seems to have straightness, you may test it surely by *looking into the line.* And, as the quality must be in there, no matter how you look, and, as you see best into the line by magnifying it, it follows that the more you magnify the line, the more likely you are to discern its straightness. If, then, you don't find the straightness, the line plainly lacks the quality *'absolutely.'* For there is only one way in which a line can have a quality; and that is inside it. If the straightness is the appearance of the line *at a distance;* or if, to eliminate psychology altogether, the line casts a straight projection on a certain plane (though *not* on a certain other plane), this straightness does not 'belong' to it at all; it is not really *its* quality, or—as others would say—it is not a real quality of the line (but an ideal one)."

Reductio ad Absurdum of this Argument.—The argument might, of course, be attacked through its metaphysical presuppositions. We might urge, and correctly, too, that no adequate reason appears for our refusing to rate as an intrinsic or proper character of an entity one which the entity displays only under certain conditions. In saying this, we should be challenging the old substance-attribute hypothesis—and so dragging ourselves into a controversy too long to be here begun. Or, again, we might expand the point previously made, that "absolute," in a description of a figure, does not mean the same as "absolute" in metaphysics. But the most satisfactory refutation of the Pearsonian argument is that one wherein we apply the latter not to a supposed case of perceiving an idea, but to a perfectly simple case of perceiving a character admittedly perceptual. The singular beauty of such an application is that it forces whomsoever accepts it to conclude that all perceptual qualities are precisely the same sort of "ideal constructs" (or "scientific shorthand") that the geometer's straight line is. Here is a specimen of such reasoning.

Consider a book with a blue cover. We wish to find out whether the book is really blue or not. First, we define blue as accurately as possible. We state that it is the complementary of a designate yellow, that it occupies a certain position in the spectrum, that it is produced by solar light being passed through water saturated with certain chemical compounds, etc., etc. We next proceed to manipulate the blue under observation, aiming to discover whether it remains constant under all conditions. We pick up a magnifying glass

and peering through it, discern the formerly even blue now streaked and criss-crossed with darker lines made by the warp and woof of the cloth. Then we put a small shred of the blue stuff under a high-power microscope, and lo! the color vanishes! What we now perceive does not occupy the place in the spectrum which we have defined as blue. Nor is it the complementary of a designate yellow. Nor is it that which is produced by solar light passed through the saturated solution above spoken of. In short, the book cover turns out to be not absolutely blue, but only relatively blue. And what conclusion shall we draw from this fact? We shall say—following the Pearsonian argument loyally—that the blue which we have *defined* is not a perceptual blue at all, but an "ideal construct," a piece of scientific shorthand invented for the sake of accelerating our intellectual transactions. The blue which is the complementary of a designate yellow can never be seen with mortal eye. And invisible is the blue that lies between green and violet in the normal solar spectrum. For has not that which seemed to be such a blue proved to lose the appearance of it when magnified?

The reader will discover readily enough that this *reductio ad absurdum* opens the way to a very important generalization touching the experimental method on which the argument rests. Is it not clear that no inference about a datum is valid which denies the immediate character of that datum absolutely? Can we doubt that any argument which, by comparing percept with percept, comes to reject as "merely apparent" the character of such a percept, must end where Pearson ends unwittingly, namely, the complete erasure of all differences between percept and concept? The very logic by which one manipulates an ordinary object of perception so as to make it differ from its former self, thereby proving that it is not "really" what its former self seemed to be,—that very logic, I say, leads irresistibly to the preposterous conclusion that we can not see nor hear nor taste nor smell anything which we can define. The instant we can say with assurance that a character has a certain definite nature, the character escapes our senses and becomes a mental creation, a convenient artifact. And forthwith the fundamental difference between concept and percept has disappeared, for the percept itself has ceased to exist as a designable entity.

Two Objections to this Reductio ad Absurdum.—To the above refutation two replies promptly suggest themselves. In the first case, it may be urged that my comparison between the defining of the straight line and the defining of blue is quite unfair, in that the geometer does not derive his definition of the line in the manner that I have derived the definition of blue. He does not merely describe a line which he perceives; he begins with a set of ultimate presuppo-

sitions and axioms, and from these he deduces his propositions about the straight line which he incorporates in his definition of the latter. Thus the definition resembles not at all that other one of the color; for this is a simple summary of characters seen, whereas the geometrical one builds upon other than perceptual foundations. The second objection to the *reductio ad absurdum* is that a genuine and completely defined straight line is not perceived. Such a line, we shall be told, is much more than a continuous, homogeneous structure of one dimension; it is a much more precise structure than these few characterizations of it indicate. No geometer would accept these latter as a satisfactory definition. For the line can be defined adequately (unequivocally) only if based upon a number of axioms, such as the seven axioms of connection and the five axioms of order which Hilbert employs in his "Foundations of Geometry." Furthermore, we do not perceive the essential geometrical properties of the line whose definition is based upon those or similar axioms. For instance, between any two points on the line there exists an unlimited number of points; but would anybody dare assert that he sees this infinitude whenever he glances at an apparently straight line? Or, again, will he say that he actually sees that "there is no next position" in the linear continuum before him? If he will not, then he admits that what he sees is not what the geometer means and refers to under the term, "a geometrical straight line."

Answers to These Objections.—The first objection is the less serious. For few to-day will maintain it consistently. Geometers pretty generally concede that they get their original information about figures and their relations from perceived forms. The primary subject of inquiry in geometry appears in its very name; it is the measuring of the earth. And there can be no doubt that for centuries geometers had no thought of analyzing anything save the observable character of space and spatial entities. Not until the end of the last generation did another opinion arise and gain credence. And this new opinion does not *contradict* the earlier one, but only *supplements* it. According to it, geometry is founded upon certain postulates, certain indemonstrables, and certain indefinables; and, as these are made to vary, so varies the propositions which may be inferred from them. Thus, it becomes logically possible to construct a multitude of different "geometries"; to do so, one has only to omit certain basic propositions. Thus, as Hilbert shows,[1] by dropping the axioms of congruence, one may deduce a plane geometry in which Desargues's theorem is not valid. But what does all this signify as to the relation between the "ideal" line of geometry and the perceptual line?

[1] "Foundations of Geometry," § 23.

Well, it signifies much less than has been commonly supposed. All it means is that modern geometers have unearthed the presuppositions (logical foundations) of natural space and have discovered that many of them are reciprocally independent (that is, they are not derivable from one another by deduction; and the implications of any one of them individually do not depend upon the other presuppositions). *In finding such presuppositions, the investigator does not therewith alter either the character or that which presupposes them.* If the presuppositions have been correctly discerned, they must be the very propositions which imply the character of the observed spatial entities under inquiry. They must logically generate the straight line whose logical presuppositions we have been seeking. If they fail to do so, they are not the genuine presuppositions of the line (and its space system).

In saying this, however, I may seem to have fortified those who raise the second objection. For I admit that the geometer defines the line, not by simple description of what is immediately seen, but rather in terms of the implications of certain perceived characters. And I grant that these implications themselves are not necessarily perceptible. Well then, is this not a confession that we do not perceive the line that is geometrically defined? This is quite different from Pearson's argument, which is based upon the fallacy of manipulating the object. And it calls for serious consideration. It proves, however, to be untenable; for it leads to a fresh *reductio ad absurdum,* very much like the former one.

Second Reductio ad Absurdum.—The features of the geometrical line which we do not perceive are the implicates of the fundamental space characters which we do see in the visible line. And, truly, we never see with our eyes the implicates of any percept. We discover them otherwise. But what of it? How does this fact establish an incongruity between the percept and the "ideal" line? What warrant does it afford for the belief that the percept lacks some characters which the ideal entity possesses? And that this deficiency makes the former a different thing from the latter? For my part, I can not discern the slightest ground for such views. Indeed, they lead to a preposterous conclusion, once we apply their logic generally. They compel the absurd inference that we never perceive anything whatever. This result can be shown in the following manner.

The argument leading to it runs thus:

1. We perceive the line *A*. (The distance between points *B* and *C*.)
2. *A*, when analyzed logically, is found to imply (presuppose) *m, n, o, p*. . . .

3. Hence the "real" *A* is the entity logically determined by *m, n, o, p, . . .*
4. Hence the "real" *A* is a logical entity *and nothing else.*
5. Hence the "real" *A* is not a perceived entity.

In this sequence two fallacies appear. The first shows itself in the equating of "logically determined" (in 3) with "a logical entity" (in 4). The second lies in the last assertion in 4, that *A* is *nothing but* a "logical entity." The former sounds plausible enough, so long as we are talking about the geometer's line; but it loses every guise of intelligibility, the instant we apply the equational form to other matter. The fact that so much reasoning and logical analysis are required to define and describe adequately the straight line *seems* proof aplenty that the resulting entity defined is a creature of logic. But this turns out to be a mere impressionistic confusion, as I shall show in a moment. As for the second fallacy, it is the one which Perry has well named "the fallacy of exclusive particularity."[2] As it has been recently discussed in several places, the reader who is unfamiliar with it is referred to those passages. It is not my purpose to lay bare those errors; I wish only to accept the argument using them and show that its consistent outcome is quite absurd. It is now time to do this.

Suppose that we were investigating, instead of a straight line, a simple color. Suppose we asked ourselves what rigidly defined this particular red. We should not inquire into its actual cause, but only into the conditions of its generation in the logical sense. That is to say, we should not try to learn whether the color resulted, in this instance, from the combustion of calcium or from the glowing of a chunk of anthracite or from the setting sun shining through fog banks. Rather should we seek a set of propositions which determine logically a state of affairs (universe of discourse) wherein red can be defined in terms of some of those propositions. Thus, we might find that red implied (presupposed) a space system, a medium capable of propagating disturbances, a type of disturbance varying with respect to its rate and its amplitude, a refraction of the path of disturbance in passing from a medium of one density to that of another, and finally an index of refraction varying in a certain specified mathematical manner with the disturbance rate. Given these conditions, the red we see might then be *defined* as that disturbance which, in a given spectrum, produces a line in a certain position (which might be numbered from any arbitrary point of reference or otherwise designated). From the point of view of logical analysis, such a definition would be identical in structure, origin, character,

[2] Cf. Perry, "Present Philosophical Tendencies." Also, "The New Realism," pages 14, etc.

and value with the geometer's definition of the straight line. It would be logically independent of the explanation of the particular existential red, and also adequate as a basis for deducing propositions about the color.

Now, as we perceive the plain red itself, we do not see the ether that we have presupposed. We do not witness the ether waves. We can not detect by immediate observation the refractive index nor the law of sines which it expresses. What then shall we infer as to the color which we do perceive? Following the original argument under criticism, we must say that the red perceived is not the rigidly defined red; or, more loosely phrased, that the red we see is not the red which theoretical physics deals with in its deductions. Or, to revert to the inaccurate language Pearson employs in speaking of the straight line, we must say that the color we see is not "absolutely red"; that it seems to be red but in reality isn't.

Is not this a genuine *reductio ad absurdum?* The argument begins with perceptual red as a datum, and after having found the presuppositions which make that same perceptual red logically possible, it ends by asserting that the logical presuppositions of the color prove that we do not really see the color! If this is not sheer nonsense, what is?

There is another way of stating the defect latent in the argument; but, as it properly demands lengthy consideration, I can only indicate it here. The discredit cast upon the percept rests ultimately upon the presupposition that an entity is not experienced "in its reality" unless its implications (presuppositions) are experienced in and with it. This, of course, is our old friend, the internal theory of relations, bobbing up in fresh guise. In our present matter of inquiry, the doctrine may be fairly restated as follows: "A percept which is not identical with its implicates does not possess the characters it seems to possess." A line which seems unqualifiedly straight really is not if its perceptual form does not contain the implicates of straightness. Now, as a general metaphysical theory and as a factor in theory of cognition, this hypothesis has been amply refuted by Spaulding.[3] But the particular weakness of its present application might profitably be worked out. Such an inquiry would show that that philosopher who asks a poor little percept *or anything else* to live up to his internal theory is asking a logical impossibility. For no state of affairs, no entity, no proposition is identical with its own implicates *unless it implies only itself;* but none does this, and *none can do it without self-contradiction.* But I am not going to essay the proof of all this now. I leave it as a suggestion to the reader.

[3] "The Logical Structure of Self-refuting Systems," *Philosophical Review,* 1910. Also cf. his essay in "The New Realism," pages 165, etc.

Conclusion.—We have considered the only two arguments which are advanced nowadays to prove that the fundamental entities and relations dealt with by geometry are not given perceptually, but are some sort of "constructs." We have found that each argument ends in a *reductio ad absurdum* wherein the very subject of inquiry itself is denied. We have not investigated the status of all geometrical entities; but we have shown that, at least in the case of the straight line, the arguments against its perceptual existence are untenable. It is highly probable that the same might be shown with respect to several other entities, such as the circle, the triangle, the ellipse. At the same time, it is quite obvious that many other geometrical entities are imperceptible, such as the sine of an angle, or the dense series. It seems pretty safe to conclude, then, that we perceive exactly what we perceive; that when we see a line as absolutely straight, we see an absolutely straight line. And the status of what we see is in no manner changed either (1) by the fact that, from another point of view and with other instruments and other observers, it may exhibit another quality; or (2) by the fact that it does not exhibit all of its implicates. Both the qualities of other points of view and also the analytically discovered implicates are merely *added* characters, not nullifying forces. If this is true, then we must return to the natural and naïve opinion that *we directly perceive a number of geometrical entities; that these entities are not "ideal constructs" at all; that they are not constituted by their implicates; and finally that whether we can or can not perceive a geometrical entity depends upon the character of the particular entity in question, upon the angle of observation which we can take toward it, and upon the power of our perceiving organs.* In short, the problem of perceiving such a one differs not at all from the problem of seeing a molecule.

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CONTENT VERSUS "KUNDGABE" IN INTROSPECTION

PERHAPS the strongest charge which has been brought against the investigators who claim to have discovered "imageless thoughts" in introspective reports, is to the effect that no description of these new contents has, as yet, been secured. The criticisms of v. Aster[1] and Dürr[2] on Bühler's results bear upon this point, and since Dürr was one of the two observers upon whom Bühler relied

[1] *Zsch. f. Psychol.*, 1908, 49, page 69.

[2] *Zsch. f. Psychol.*, 1908, 49, page 315.

most extensively for his data, the charge has acquired added weight. Titchener, who has reviewed the evidence in detail,[3] is of the same opinion, to wit, that instead of describing imageless contents, the observers in these experiments merely communicated information about that which they had experienced, the real content of the experience having eluded them.

Titchener further upholds Jacobson's results[4] which aim to show that there are no specific "meaning processes" which underlie the informational statements of meaning, and maintains, on the basis of his own investigations, that the "attitudes implied in, or demanded by, the two modes of report . . . turn out to be, the one, that of descriptive psychology, the other, that of logic or of logical common sense."[5]

Investigations which I have made on the consciousness of meaning have revealed such a striking difference in the attitudes and results obtained from two different types of problem, that it has seemed to me worth while to report the fact briefly.

When I began my investigations in the fall of 1909, I had at my disposal only untrained observers. I wished to repeat some of Bühler's experiments, but realizing the unusual demands upon introspective ability involved in his method of introspecting the meanings of aphorisms, I decided to begin my investigations with the simpler problem of introspecting the meanings of words. Only after four such series of 50–100 words each had been performed, did I venture to study the consciousness evoked by aphorisms and simple logical problems.

In working up my results, I made use of a statistical method, classifying the data of each report in accordance with certain familiar categories. The main groups which proved adequate for the experiments with word-stimuli were the following: (1) Concrete imagery: visual, auditory, kinesthetic, and miscellaneous. Here were classed all concrete images, including bodily sensations. (2) Verbal imagery: visual, auditory, kinesthetic, and miscellaneous,—the latter group embracing instances in which the imagery was mixed or inexactly identified. Some sensational factors were also attributed to this class. (3) Affection: feelings of satisfaction or dissatisfaction, amusement, familiarity, and the like, although it may be noted in passing that many of these instances appeared to be judgmental rather than truly affectional in nature. (4) Notions: imageless contents, embracing both concrete and abstract data which were

[3] "Experimental Psychology of the Thought-Processes," 1909, pages 145 ff., also *Am. Journ. of Psychol.*, 1912, 23, page 165.

[4] *Am. Journ. of Psychol.*, 1911, 22, page 553.

[5] *Loc. cit., Am. Journal of Psychol.*, page 182.

declared to be as definitely present as were the elements of the other categories, but in which no imaginal or affectional characteristics were evident.

When I proceeded to treat the reports secured with aphorisms and other statements involving a more extended thought-process, I was surprised to find that my method was inapplicable. Very rarely was an image reported, and no longer were the notions described as contents, which could be differentiated from images and affections. The introspection appeared to be directed, not upon the content of the experience, but upon the process and the relationships which were involved.

For the purpose of this article I have selected results from two of my series which are as nearly comparable as possible, in order to indicate this difference. Series III. was the third series of experiments performed. It included 100 words, 40 of which were repeated from previous experiments and are here eliminated. Observer A performed but half of the series, while observer O., who used a different series of words, performed 32 "originals" and 16 "repeats."[6] Series V. followed series III. after an intervening series in which the reaction-time was primarily the object of study. Series V. experimented with aphorisms, the set used by observer O. being again different from that used by the other three observers. Both words and aphorisms were given orally by the experimenter, the observer being instructed to secure the meaning and react by uttering the word "yes" (or "no," in the case of aphorisms where disagreement was to be indicated). Since the method used in series V. was altered during the course of the series to adopt a visual form of exposure, it happens that the number of experiments here reported differs for each observer.

The time of reaction was measured with a stop-watch. The results are indicated in the following table:

TABLE I

Obs.	Series III.				Series V.			
	Number	Arith. av.	Median	Mv.	Number	Arith. av.	Median	Mv.
A.	30	5.74″	5.4″	1.36	20	12.88″	11.0″	4.42
D.	60	1.31	1.2	0.182	41	7.14	6.6	1.97
V.	57	1.72	1.8	0.215	27	6.82	6.4	1.56
O.	32	5.09	4.6	1.586	32	17.9	15.2	6.42

It will be noted that the reaction-time of series V. was much longer and less uniform than that of series III. This, of course, re-

[6] The observers of these two series were the following persons: A., Mr. W. S. Adkins, a senior student; D., Mr. F. A. Davis, a junior student; V., Miss Sabra Vought, the university librarian, and O., the writer.

quires no special comment. The fact that in series III. the observers were instructed to "be in no hurry to react," may account in part for the lengthened time of observers A. and O., as compared with that of observers D. and V., though it was also evident that the first two observers were of a more deliberate type than the latter two.

The results of the statistical inquiry into the reports of the two series are given in the following table:

TABLE II

		Series III. Obs. A. 30 experiments		Series V. 20 experiments		Series III. Obs. D. 60 experiments		Series V. 41 experiments	
		No.	%	No.	%	No.	%	No.	%
Concrete imagery	vis.	14	46.6	2	10	9	15	1	2.4
	aud.	2	6.6	—	—	1	1.6	—	—
	kin.	2	6.6	—	—	3	5	—	—
	misc.	—	—	2	10	3	5	—	—
Total		18	60.0	3	15	16	26.6	1	2.4
Verbal imagery	vis.	5	16.6	—	—	21	35	1	2.4
	aud.	—	—	—	—	2	3.3	—	—
	kin.	4	13.3	—	—	4	6.6	—	—
	misc.	1	3.3	8	40	29	48.3	1	2.4
Total		10	33.3	8	40	56	93.3	2	4.8
Affections		13	43.3	6	30	6	10	1	2.4
Notions		29	96.6	20	100	55	91.6	41	100

		Obs. V. 60 experiments		27 experiments		Obs. O. 32 experiments		31 experiments	
		No.	%	No.	%	No.	%	No.	%
Concrete imagery	vis.	25	41.6	3	11.1	11	34.3	4	12.9
	aud.	1	1.6	—	—	—	—	—	—
	kin.	5	8.3	—	—	2	6.2	—	—
	misc.	—	—	—	—	2	6.2	—	—
Total		30	50	3	11.1	15	46.8	4	12.9
Verbal imagery	vis.	14	23.3	1	3.7	11	34.3	3	9.6
	aud.	1	1.6	—	—	—	—	2	6.4
	kin.	1	1.6	—	—	2	6.2	—	—
	misc.	2	3.2	1	3.7	1	3.1	3	9.6
Total		18	30	2	7.4	14	43.7	8	25.8
Affections		4	6.6	3	11.1	7	21.8	4	12.9
Notions		48	80	27	100	31	96.8	31	100

(The "totals" of concrete and verbal imagery refer to the number of different experiments in which the imagery occurred.)

Here are indicated the total number of experiments, and the number and percentage of appearances of each of the elements described above. It will be noted that despite the individual variations, which are striking, the presence of imagery, both concrete and verbal, in series III. was very frequent for all observers. Affection occurred

less often, while notions were the most invariable contents, except in the case of observer D. who reported verbal imagery more often. We may add that the instances in which imagery and affection appeared to make up the complete content of the experience were, in number, one for observer A., five for observer D., twelve for observer V., and one for observer O. The instances in which only notions were reported were, in number, four for observer A., fifteen for observer D., twenty-one for observer V., and one for observer O.

It is not the purpose of this paper to enter into a more detailed discussion of the grounds upon which notions may be distinguished from imagery and affection, but merely to emphasize the fact that in reports such as these, where description of content is decidedly the rule, the best of evidence should be procurable for such a distinction.

The results of the same method of analysis as applied to series V. are a striking demonstration that here description was *not* the rule. Only in the case of affections do we find percentages of appearance which approach at all nearly to the percentages of series III. Verbal imagery for observer A. is slightly in excess of that found in the earlier series, but every other result for imagery is relatively negligible. As for the appearance of notions, the ascription of 100 per cent. in each instance is purely inferential.

In making this comparison, it should be borne in mind that series V. was performed by the same observers who had previously demonstrated their ability to describe psychologically in each of the four series with word-stimuli. The fact that they did not use this method in series V. indicates the fundamental difference in the attitudes which prevailed in the two series. From this I conclude that the method of studying the thought-process by the arousal of complicated experiences is unsuited to a description of content. The simpler method of arousing a brief consciousness of meaning with reference to a single object or word, however, seems from these results to be a very adequate means for procuring an analysis of content. A further series of experiments which I performed with two of these observers, A. and D., exposing the stimulus-words with a card-changer and measuring the reaction-time by a chronoscope, resulted in a reduction of the average time to 1.1″ and .8″, respectively, without any corresponding diminution in the content of the experiences, or in the observer's ability to analyze it. This, we may note in passing, accords well with the results obtained by Hillgruber, and reported by Ach,[7] to the effect that more efficient intellectual work may be secured under the stress of a quick reaction, than when the observer selects his own time for the procedure.

It may not be concluded, however, that thought-experiments of the

[7] *Zsch. f Päd. Psychol. u. Exp. Päd.*, 1913, 14, page 1.

Bühler type have no scientific value. On the contrary, the results secured, even with such comparatively untrained observers as were here engaged, indicate many important facts regarding the course of thinking and the nature of the relations involved in the thought-process. What we have not secured from them in the experiments at hand is an adequate description of the content which was experienced.

In order to make the distinction between these two types of report more clear, and at the same time to indicate their respective values as scientific data, I have selected for further consideration two parallel reports of each observer, one from series III. and one from series V.:

Observer A., III., 15, *Sale*, 8.6″.—First, the noun, sail, on ships, to catch the wind—used on small boats. Second, thought reference to the church hymn: "We'll sail the wide seas,"—seemed rather amusing. Third, image of some sort of small boat, possibly a picture of a yacht—white sails. Conscious of the act of sailing, impression that the boat was going from right to left across the field. Also conscious of the part of the yacht which is below the water.

Secondary introspection:[8] Can't base the amusement; due, probably, to a general habit or attitude. Just at last, thought of it as a verb. No reference to *sale*. The duration seemed longer.

This report indicates three principal moments. It is not purely descriptive, but description is clearly in evidence. The notion of something-on-ships-to-catch-the-wind is the characteristic of the first moment, and it appears to have been imageless. The second moment was probably verbal and affectional. The third was imaginal, though not entirely so, for the act of sailing and a sense of direction were involved. The reference to the portion of the boat below the waterline is also notional. The fact that "small boat" occurs in both the first and third moments, indicates the probability of a relation which was not entirely disrupted by the irrelevant second moment. It also calls in question the exact line of demarcation between the first and third moments. They appear to have become somewhat mixed in the introspection.

Observer A. V., 7, "How fruitful is modern philosophy, for she is constantly coining new terms," 11.8″.—After, or during, the first part I seemed to go to work on it. As a basis I had a very general view of the schools of modern philosophy beginning with Kant—references to Hegel and Fichte, and general reference to all modern philosophies. Even then I did not see the object of such a statement (regarding) just the first part. I doubted if it would come in this class. All thought was cut off by the second part, but there were still tendencies to refer back—an attitude. Disturbed by the intention to be funny. I knew it was funny, but it did not strike me. Just at last came the thought that modern philosophy is fruitful, but not because it coins so many terms.

Secondary introspection: Tendency to deny what the statement implied.

[8] The secondary introspection was drawn out by questions of the experimenter.

This report does not reveal specific notions or images, but there is an indication of the thinking-process involved in the abrupt disjunction of the first and second parts of the statement, and the tendencies to relate the second back to the first. The complex "thought" of the schools of modern philosophy which attached to the first part, and the disturbance due to the "intention to be funny" which the second part introduced, are characteristic of the mental work which was accomplished. The whole culminates in a judgment which cuts the Gordian knot in its failure, or refusal, to take cognizance of the irony which was implied. As to the nature of the images or simple notions which may have been present, we have no evidence.

Observer D., III., 93, *Elk*, 0.8″.—Familiarity with the word. Visual image of the word, then of a pair of antlers. I thought I knew what the meaning of the word as attached to antlers was. Thought of an Elk as a member of that lodge—tendency to look in that direction. Recalled a person who is an Elk. No image.

Here the central feature of report is two visual images. The thought that "I knew what the meaning of the word as attached to antlers was" may have been merely a feeling of familiarity. The thought-of-an-Elk-as-a-member-of-that-lodge appears to be a notion which provoked the tendency to look in the direction of the local Elk's lodge, and associated another notion of a person who was an Elk. The fact that this last combination of notions and direction-tendency were reported without imagery is significant, since the first appearing facts were images.

Observer D., V., 24, "Beware of the man whose God is in the skies," 5.4″. —Many associations attributable to reading. I did not see the meaning at first. Then it occurred: Beware of such a man because such a God has not much to do with his life. Then reference to a man whose religion and morality are separate. Associated at the time of reaction a remembrance of reading somewhere: If a man comes to your house and tells you he sees no distinction between virtue and vice, put your spoons away.

Secondary introspection.—There was a reference to the Greeks as having their religion and morality separate. This was condemned offhand, because I had considered it in the past as a result of class discussion and reading. Morality and religion are not necessarily the same, but they go hand-in-hand.

Here again we have largely "Kundgabe," rather than content. We can see, however, that the meaning was mainly attributable to associative references which were familiar, and more or less explicitly reproduced. As to the nature of this reproduced content, again, there is no evidence.

Observer V., III., 44, *Stole*, 1.8″.—First, the verb, something taken, not clearly carried out, but recognized as theft. Second, as applied to the garments of the clergy. Vague image of a clergyman in his robes. It might have been Mr. W—, a tall man in a green stole. The green stole is the one used at this season of the year. This fact was recognized.

The contents here are primarily two, the first notional, the second imaginal. It is not impossible that the notion may have had a verbal vehicle. The recognition that "the green stole is the one used at this season of the year" is, perhaps, more evidentially notional, though even here it might be contended that a feeling of familiarity and appropriateness would exhaust the actual content of the experience.

Observer V., V., 22, "Decency is indecency's conspiracy of silence," 12". —I take it to mean that indecency affects decency to cover up its own defects. Do not quite understand what conspiracy of silence. A show of decency will cover up indecency. There came the thought: "A prude is a female going about looking for temptations to resist."

Secondary introspection: It seemed a rather clever putting of words.

The understanding of this statement was apparently assisted by the revival of an analogous "thought." There is also indicated the stumbling-block which "conspiracy of silence" provoked. This was evidently not clearly worked out. There was an impression that the statement was apt and clever, without a full understanding of its meaning. The evidence as to content is again lacking.

Observer O., III., 44, *Ghost*, 4.6".—Clear consciousness of spelling, *gh* prominent. Word visualized as if lettered by hand. Reference to one of my extension lectures on "Ghost Hunting." It seemed as if many associations or thoughts might develop here, but none was indicated. Association with Palladino, and reproduction of her picture in the *New York Times*, Sunday. Came back to word. Thoughts and images of the ghost-hands in Palladino's séances.

We have here three moments. The first was a visual verbal image. The second reference was apparently notional, though it may have been verbal. An expectancy which it evoked failed to be realized. The last moment is confused, but involves a definite visual image.

Observer O., V., 21, "The final aim of science is concrete prevision," 13.6". —Understood immediately as being able to predict things. Question: Why *concrete?* Without much interruption, it became indicated that science was not a generalization or speculation; that, given certain materials, the aim of science was to tell what would happen to them when you put them together.

First we have an indication of general understanding which is, however, arrested by the use of the word "concrete." This led to a further process which eventuated in a more complete understanding. No descriptive contents are indicated.

It may be concluded that these parallel cases show markedly different attitudes and results. The reports of series III. aim to be descriptive, and in large measure achieve this aim. Those of series V. are informational, and deal with complex thoughts without detailed analysis. Both have their scientific value, for while the first method secures a description of content, it fails by its simplicity to

provoke any sustained thinking. The second method secures such thinking, and gives evidence as to thought-relations and their dependence upon associations, but it fails to describe the contents involved. In short, the one method complements the other. Of course, it is not impossible that more expert observers might also secure a description of content with the second method, yet the difference in attitude is apparently so profound that we should perhaps do well to rest our analyses of content for the present upon those briefer moments which can be more adequately inspected.

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DISCUSSION

CAN SCIENCE SPEAK THE DECISIVE WORD IN THEOLOGY?—A REJOINDER

IN a recent article, under the above title, Dr. Cooley[1] takes issue with a thesis I maintained in a paper read at the last session of the American Philosophical Association. In his own words, my thesis is that "Psychology is competent to reach trustworthy *scientific* conclusions regarding the *objects* of theological inquiry."

It is essential to the understanding of the present discussion that "objects" of theological inquiry should be taken to mean not the Absolute of the metaphysicians, but *the Gods of the historical religions, i. e.*, persons in direct anthropopathic communication with men. That is the sense I gave to that word in my paper. The God meant and addressed in the Christian prayerbooks of every denomination, as well as the gods of the barbarians, are of another species than the God of the Gifford lecturer. Any one in doubt regarding this difference need only ask himself what would remain of our church practises and of our Christian dogmas were they intended *for* our philosophers. How instructive would be a Christian book of common worship, prepared by and for those distinguished metaphysicians who are looked upon, with or without their consent, as champions either of the Christian religion, or of religion pure and *undefined!*

Dr. Cooley's argument runs thus: Religious experiences are "essentially secret and private"; they have in each case but one observer, and so but one reporter. They are facts, but not facts the observation of which is open to correction through the common inspection of many

[1] This JOURNAL, Vol. X., page 296.

investigators. "The psychology of religion does not possess, and seemingly can never possess, a body of critically determined and recognized *facts*, in the scientific sense." Therefore, in that field, no conclusion can have a coercitive value. Psychology is not "competent to pronounce as to the objective actuality of the *objects* with which religious experience is concerned." Let us put the argument in the syllogistic form:

Every science possesses necessarily a body of facts recognized, in one and the same meaning, by all the specialists in that science.

There can be no such body of facts in the field of religion, for religious experiences are secret and private.

Therefore, no scientifically established generalization is possible in that field.

Before proceeding to show the falsity of the minor premise of this syllogism, I beg leave to say that I do not know of any contemporary psychologist ever making the affirmation it contains. Those who have urged it have been men unfamiliar with the methods and the achievements of recent psychology. A psychologist but little acquainted with the phenomena of religion might, indeed, hold that *at present* there is no sufficient body of generally acknowledged data, but would not say that there *can not* be. He could not say that without implying either that no part of conscious life is amenable to scientific treatment, or that religious life is a sphere of existence of another kind than the rest of conscious life. But, either horn of this dilemma is inacceptable, so far as I know, to the psychologists.

Concerning what he calls "ordinary normal psychology," Dr. Cooley writes that there are abundant indications that the functioning of the vast multitude of individual minds, especially those of the same race, are remarkably alike—sufficiently so to be subject to safe generalizations." He admits thus the existence of a scientific psychology. If he excludes the religious life from the possibility of scientific treatment, it is only because "in religion, on the contrary, the indications make strongly for the conclusion that different minds function in a great variety of ways—in such ways, indeed, that one man is often quite at a loss to understand the religious life of another." This variety of ways seem to him so infinitely great that not only is there *at present* no sufficient visible uniformity and regularity to make possible generalizations, but no amount of observation and comparison on the part of psychologists is likely ever to make possible a generally accepted classification and description of the facts of religious life!

I confess that I do not see how a forecast as hopeless as his should be possible to any one acquainted with the history of any science.

Dr. Cooley affirms now of the psychology of religion what might have been said, and no doubt was said, of every science, at its inception. How can one make such an affirmation to-day with text-books of psychology in the window of every bookshop, and illuminating (if not final) treatises on topics as difficult as hysteria, multiple personality, dreams, insanity, etc., on the shelves of every university library? If Dr. Cooley had been content to say that generalizations in the field of religious experience are premature, one might be patient with him. But "the subject matter of the psychology of religion" yields, in his opinion, no promise of such an achievement, and he sees no hope whatsoever of the psychology of religion ever becoming "in any measure an applied science."

My studies in this field have led me to an altogether different opinion from the one entertained by Dr. Cooley. The religious life does not appear to me as a chaotic world, without regularity and uniformity. On the contrary, I see that, though highly complex, religious life has yielded already a quite definite series of facts, described with considerable uniformity by those who work in that field. Religious experiences are "private and secret?" Just as much so and no more than any other "inner" experience; just as much, for instance, as the emotional life. Is it not well known that many mystics have left detailed records of their experiences and that these records are in substantial agreement, even those of the Christian with those of the Hindu mystics? Similarly of conversion, there are extant many well-described conversions, and the number of recorded instances can be added to almost at pleasure. As a matter of fact, a large number of carefully observed cases have been gathered and many of them are in print. They constitute a valuable set of "recognized facts in the scientific sense," characterized by important and well-marked common features. There is also a very high degree of uniformity in the description of the fruits of religion, as made by its votaries. Of this, I provide, I think, a satisfactory demonstration in the documents to be found in my book.[2]

The preceding remarks can be convincing only to those who are familiar with the literature on these subjects. But every one knows at least of the uniformities of *belief*. The creeds of the various Christian churches, different as they may be, contain, nevertheless, a common core. Does not this common element point to fundamental uniformities in Christian religious experience? It is too late to say that the essential features of the several aspects of religious experience can not be discriminated and set forth with the definiteness and

[2] "A Psychological Study of Religion," pages 212–233.

uniformity required of a body of facts from which scientific conclusions are to be drawn.[3]

I claim no more than a degree of agreement among authorities, regarding many phases of these experiences, sufficient to warrant conclusions deserving to be called scientific. I add that here, as in any other science, agreement waits upon investigation.

For the rest, the chief purpose of my New York paper, and of the chapter of my book[4] from which that paper is drawn, was not so much to affirm the competency of psychology to reach trustworthy scientific conclusions regarding the Gods of religion, as to oppose the claim of the most powerful—the only powerful—theological movement of the time. My main affirmation was concerning *that which is impossible to theology without psychology and without metaphysics.* Though they reject the assistance of metaphysics and rely solely upon "inner experience," these empirical theologians think that they may continue in the assurance of the objective existence of a God in direct communication with man. But they have thus, apparently unbeknown to themselves, made of their God-idea an hypothesis open to scientific verification. Why then should they deny the right of science to pronounce upon the validity of their hypothesis? Have they not made of theology a branch of psychology?

I can not conclude without indicating the bearing upon the theology of inner experience of Dr. Cooley's argument against psychology. If he is right in his contention, then, that theology, and the psychology of religion, would be equally impossible; there could be only *private* theological opinions. When he asks, "What kind of an emotional experience and what amount of it is reliable indication of a supersensible and superhuman stimulus? What kind of intuition and what degree of it warrants one in thinking he has seen God?" he raises difficulties, which, if real, are just as fatal to empirical theology as to the psychology of religion.

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[3] The orderliness and the uniformity of many facts of the religious life, and the agreement among psychologists regarding these facts, will be set forth, I hope convincingly, in a volume I am now preparing on the "Contents of Religious Experience."

[4] *Ibid.*

REVIEWS AND ABSTRACTS OF LITERATURE

Der vorchristliche Jesus. WILLIAM BENJAMIN SMITH. 2te Auflage mit Vorwort von PAUL WILHELM SCHMEIDEL. Jena: Eugen Diederichs. 1911. Pp. xxix + 243.

The first edition of this work was published in German in 1905, and since then the author's thesis has received widespread attention all over the christian world. That an American mathematician writing from Tulane University, where Smith is a professor, should defend a thesis in opposition to a whole army of higher critics and receive such widespread, and, on the whole, serious attention from a score or more of them, speaks well for American scholarship in this field.

The kernel of the five essays in the book can perhaps be presented as follows: The original doctrine concerning Jesus, a divinity who emancipates, protects, and heals, was the belief and teaching of a prechristian cult which, between the years 100 B.C. and A.D. 100, more or less enveloped in secrecy and "mysteries," was widespread among the Jews and especially among the Greeks. This doctrine was the original source of christianity, which arose, consequently, from many centers, and not, as a later tradition maintains, from the single center of Jerusalem. Jesus was called "the Nazarene," not from the city of Nazareth (which did not exist at that time), but from the Hebrew meaning of the root of the word, "the keeper" or "guard." His *anastasis* meant originally his installation as "Messiah," "World-Ruler," "Judge of the living and the dead," and so forth; and this was later, by the addition of the supplementary phrase "from the dead," changed into the resurrection. The "two great ideas," the one, imposing, preached by John the Baptist and others, of "One who shall come," and the other, milder and more genial, "of Jesus," were originally different, but were finally united in the world-conquering concept of Jesus Christ. The idea of the seed-sower had to do originally with God's sowing the seeds of the Logos which produced the world, a picture of the origin of the world possessed by prechristian Naasenes (erroneously considered by some to be merely a sect of the christian gnostics). No one knew of Paul's letter to the Romans until the year 160 A.D.

Smith writes, "The Jesus-cult is an historical fact, and indeed the most important historical fact there is for us. In the gospels the Jesus-concept is dominant, and in the other writings of the New Testament the Christ-idea is subordinate to it. . . . Orthodoxy or conservatism says that Jesus was god-man, *echter Gott und zugleich echter Mensch.*" For science, however, this notion remains an unthinkable *Unding*. To explain Jesus there are for science but two possible hypotheses. "Either Jesus is a deified man, or he is a humanized god. Like the undulatory theory of light, the first hypothesis is now a very highly developed concept. On it, especially in Germany, three generations of scholars, among them men of genius, have labored with unfaltering zeal. With what result? One must confess, with a negative result. In short, the attempt to explain the appearance of the Jesus-cult, the new gospel, and the chris-

tian propaganda by any conceivable idea of a purely human Jesus, has, in the light of historical criticism, in no respect and in no degree, succeeded. The complete failure of this noble, century-long effort becomes daily more and more obvious. . . . If it were possible to explain the facts in accordance with this hypothesis, German science would long since have done it. . . . I challenge the higher critics to mention a single crucial fact of original christianity which is satisfactorily explained by their theory. . . . The problem can never be solved in this way. . . . Hence we must assume that Jesus is a humanized god, and carefully test whether on the basis of this assumption a view free from contradictions, in which all is in order, can be developed. This is the only scientific method. In it alone can we hope for a final solution of this most important and most interesting of all historical problems." And Smith goes on to maintain that christianity will lose nothing and gain in every way by such a solution.

In the preface of the first edition, Schmeidel announces himself as an opponent of Smith's views, but vouches for the author's scholarly abilities and thorough methods, saying it will be difficult to refute Smith's conclusions. Soon after its publication, however, in a work entitled "Ist das 'liberale' Jesusbild Wiederlegt?" Weinel spends much ink in saying, with very little grace, that Smith does not know what he is talking about. In Drews's "Christusmythe" Schmeidel is criticized for writing the preface to such a book; and Johannes Weiss, in "Jesus von Nazareth Mythus oder Geschichte," writes that Schmeidel "might have done better than, by writing a preface, supply this book with a foil." Schmeidel, in a later article, pleads that he only wished to call the attention of his colleagues to the views of Smith and those who sympathize with him. Pfleiderer, Borinski, von Schnehen, Soltau, Meyboom, Vollmer, Vexler, Picard, and many others have given the book serious attention, some confessing that Smith is no dilettante, that his views must be taken seriously and that they are conceived and presented in the spirit of a profound scholarship. Wernle speaks of *"diesem kaum ernstzunehmenden Buch,"* and by innuendo even casts aspersions on Smith's sincerity. Smith, however, in courteous and cogent replies, gives his critics, as it seems to the present writer, far better than he gets—and the contest is interesting. The many criticisms of the book have not given the author reason for modifying the original text in this second edition.

Meanwhile the discussion has been taken up by liberal journals in this country, Volume XV., for example, of the *American Journal of Theology* containing several articles dealing with different phases of the question.

Smith's method may be exemplified by his treatment of Acts 18: 24–28, where the text seems clearly to imply that an eloquent Alexandrian Jew named Apollos, who was "instructed in the way of the Lord," but "knew only the baptism of John," first learned from Aquila and Priscilla at Ephesus that the "Lord" was the historical Jesus. Thereafter, "he mightily convinced the Jews, publicly, shewing by the scriptures that Jesus was the Christ."

The importance of the book is evident in the fact that a general ac-

ceptance of its thesis would involve a radical revision of traditional views as to the origin of christianity, and the author writes with the clearness and logical force of one who knows his ground and is willing to tell all that he knows on a great theme.

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The Higher Aspects of Greek Religion. L. R. FARNELL. New York: Scribners. 1912. Pp. 155.

These six Hibbert Lectures were delivered at Oxford and in London in April and May, 1911, and bear the following captions: (1) "General Features and Origins of Greek Religion"; (2) "The Religious Bond and Morality of the Family"; (3) "Family Morality (continued): Tribal and Civic Religion"; (4) "Influence of the Civic System of Religion upon Religious Thought, Morality, and Law"; (5) "Expansion of Greek Religion beyond the Limits of the Polis"; (6) "Personal Religion in Greece."

Readers familiar with Dr. Farnell's admirable work, "Cults of the Greek States," will not need to be told that he is a scholar of conservative temper, accustomed to weigh evidence, and disinclined to substitute hypothesis for ascertained fact except when duly acknowledged. In these days of somewhat wild speculation in matters connected with religion which flourishes under the guise of historical research, it required courage bordering on temerity to pronounce in Oxford and Cambridge, the seats of the most speculative exchanges, discourses so severely and studiously tame as those contained in this volume. Dr. Farnell, to be sure, possesses not only the courage of his convictions, but also a reputation for sound scholarship sufficient to warrant him in thus bearding the lions.

Moreover this mode of treatment is not a manner assumed for effect but the natural expression of the author's fundamental conception, which agrees with the traditional view in holding that Greek religion was mainly a social-political system and that such traces as undoubtedly exist of animism, magic, or initiation-rites, are not of its essence, but more or less adventitious survivals or accretions. Although but yesterday generally accepted, so rapidly have the revolutionists been making headway that to-day it sounds rather heretical to say that Greek religion "is in its earliest period a 'theistic' creed, that is, a worship of personal individual deities, ethical personalities rather than mere nature forces," and that anthropomorphism is its predominant bias. Doubtless those who think otherwise incline to regard Dr. Farnell's views as biased by his preoccupation with the state cults and the Olympian deities to whom they are addressed and his frank subordination of private cults. It is only in the last chapter that he touches on the mysteries, and even then it is the Eleusinian, the most nearly fully adopted by the state of all mysteries, with which he is chiefly concerned. This objection, however, may readily be too much pressed; for if one takes a large view, as Dr. Farnell evidently conceived it his duty to do, it is undoubtedly true that the public cults of the several states, not only by their public character

reveal their prominence, but also in the total evidence bulk largest, and therefore deserve first attention in a general survey.

To be sure, "personal religion" is far more in keeping with modern conceptions of religion, and there have not been wanting those who would refuse the name of religion to the Olympian worships with their large admixture of festive cheer and local patriotism. But surely puritanism and pietism are not the only forms of religion. Again, it is the less generally known forms of cult, as of other things, that naturally engage the attention of the specialist; and it is therefore difficult for the specialist to preserve a due sense of proportion in assessing the relative historical values of that which is so well known as to be trite (but not therefore less true) and of that which requires to be disclosed by elaborate research and painstaking reconstruction. This balance Dr. Farnell has endeavored not without success to maintain. To have done so in the brief compass of six lectures is no mean achievement. The special student of Greek religion will, of course, find little in the present book to interest him, except the author's matured judgment on several large questions and his evaluation of the several factors as indicated by the distribution of emphasis; but the general reader will, therefore, be able with the greater confidence to use it as a safe guide to a subject justly claiming the attention of thinking men.

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A First Book in Psychology. MARY WHITON CALKINS. Third revised edition. New York: The Macmillan Company. 1912. Pp. xix + 426.

In presenting the third edition of this book the author has taken occasion to introduce certain revisions (chiefly by way of added and transferred portions) calculated to stress the social nature of the self, to emphasize the study of behavior, and to eliminate expressions suggestive of atomistic psychology. These changes are all in the direction of genuine improvement. Changes in conception in the discussions of attention, volition, and time, are also pointed out. A bibliographical supplement is added. The characteristic appendix (139 pages) is retained.

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JOURNALS AND NEW BOOKS

ARCHIVES INTERNATIONALES DE NEUROLOGIE. January, 1913. *Syndrome paralysie générale subaigu; récidive à l'occasion d'une grossesse* (pp. 1–7): HENRI DAMAYE. – An account of a case of paresis partially cured by therapeutics, and in which a subsequent pregnancy caused a relapse followed by a fatal issue. *Le pouls des aliénés* (pp. 7–10): PROFESSOR SIKORSKY. – In each normal person, the pulse is character-

istic; and, as well as handwriting, constitutes a permanent feature of the individual. To each type of mental disorder there also corresponds a unique pulse, which synthetizes the symptoms of the psychosis. *Les trois "visions" de Benvenuto Cellini* (pp. 11–25): GEORGES VARENNE. – The three visions of Benvenuto Cellini were manifestations of a transitory psychosis, of hysterical origin. *Réforme du règlement de 1857 sur le service des aliénés* (pp. 25–35): DR. LEGRAIN. – The regulations now in vigor in insane asylums ought to be modified. The capital aim of these institutions ought to be the cure of the inmates. *Sur les relations entre traumatismes crâniens et maladies mentales et nerveuses* (pp. 35–40): F. W. MOTT. – Cranial traumatism may give rise to various psychoses, such as Korsakoff's. It is not easy, however, to tell how far the psychosis is due to the trauma and how far to the previous mental condition. *Revue des Sociétés. Analyses bibliographiques.*

REVUE DE MÉTAPHYSIQUE ET DE MORALE. January, 1913. *Sur les méthodes de la grammaire comparée* (pp. 1–15): A. MEILLET. – The author describes the method of reasoning of the comparativists and shows its logical limitations. *Le rythme du progrès et la loi des deux états* (pp. 16–60): L. WEBER. – A criticism of Comte's law of the three stages, substituting for it a sort of "binary rhythm" in which periods of speculative and of technical activity predominate in turn. *La nature de l'espace (fin.)* (pp. 61–100): CH. DUNAN. – The author examines the conceptions of space of Leibnitz and Kant and shows how mathematics points to the nativistic conception of space. *Note sur le sens équivoque des propositions particulières* (pp. 101–106): S. GINZBERT. – No definition of "some" is wholly satisfactory. "Reasoning becomes precise only at the expense of suppleness and inversely." *Études critiques. Les étapes de la philosophie mathématiques:* P. BOUTROUX. *Questions pratiques. La tempérance:* TH. RUYSSEN. *Supplément.*

Bosanquet, Bernard. The Distinction between Mind and Its Objects. Manchester: University Press. 1913. Pp. 73. $0.36.

Hadley, Arthur Twining. Some Influences in Modern Philosophic Thought. New Haven: Yale University Press. 1913. Pp. vii + 146.

Jerusalem, Wilhelm. Einleitung in die Philosophie. Funfte and Sechste Auflage. Vienna and Leipzig: Wilhelm Braumüller. 1913. Pp. xiv + 402. 7 M.

Jevons, F. B. Personality. New York and London: G. P. Putnam's Sons. 1913. Pp. vii + 172.

Santayana, George. Winds of Doctrine: Studies in Contemporary Opinion. London: J. M. Dent and Sons. New York: Scribners. 1913. Pp. 215.

Wilm, E. C. The Problem of Religion. Boston: The Pilgrim Press. 1912. Pp. xii + 240. $1.25.

Woods, Frederick A. The Influence of Monarchs. New York: The Macmillan Company. 1913. Pp. xiii + 422.

NOTES AND NEWS

"A JOINT session of the Aristotelian Society, the British Psychological Society, and the Mind Association was held on June 7 and 8 at University College, London, and Crosby Hall, Chelsea. The first meeting consisted of a symposium, 'Are Intensity Differences of Sensation Quantitative?' by Dr. C. S. Myers, Professor Dawes Hicks, Dr. H. J. Watt, and Dr. William Brown, under the chairmanship of Professor Spearman. Dr. Myers showed that the 'all or none' principle is obeyed by all kinds of reflexes and all kinds of sensibility. The type of reaction is therefore the correlate of quality of sensation and the difference of degree—moreness or lessness of the same reaction is the correlate of difference of intensity of sensation. The second and third meetings, presided over by the Hon. B. Russell, were devoted respectively to a discussion on memory and consciousness, opened by Dr. Robinson, and to a symposium, 'Can There be Anything Obscure or Implicit in a Mental State?' by Mr. H. Barker, Professor G. F. Stout, and Professor R. F. A. Hoernle. Dr. Robinson said that M. Bergson, in his 'Matter and Memory,' neglected the fact that memory was an assertion, and that he did not do justice to the function of meaning in remembering. Intuition and intelligence must be somehow inclusively related. A vigorous discussion revealed many criticisms opposing this anti-Bergsonian thesis. In the symposium Professor Stout maintained that within the field of consciousness, whether of mere sense experience or of thought, there are contents which are not separately discerned. The opposing point of view to this was due to a confusion resulting from the fact that the presence of implicit consciousness can only be ascertained by a process of analytic scrutiny rarely present in normal conscious life."—*Nature.*

THE Académie Française has awarded the Grand Prix Broquette Gonin, of the value of $2,000, to Professor Grasset, of Montpellier. The prize is for "the author of a work, philosophic, political, or literary, which shall be judged to be of a nature to inspire the love of the true, the beautiful, and the good." Professor Grasset, who is known for his researches on the nervous system, is also the author of several works on questions of psychology, moral responsibility, and the philosophy of practical life.

DURING the leave of absence for the next academic year of Professor Wendell T. Bush, courses in philosophy will be given at Columbia University by Professor Norman Kemp Smith, of Princeton University, and Professor Harry Allen Overstreet, of the College of the City of New York. The Reverend Father Cornelius Clifford, Rector of St. Mary's, Whippany, New Jersey, will also be a non-resident lecturer during the first half-year, offering a course on Scholasticism.

PROFESSOR HENRI BERGSON delivered his inaugural address as president of the Society for Psychical Research on Wednesday, May 28, in the Æolian Hall, New Bond Street. M. Bergson took as his theme a study of the nature of the prejudices against the work and methods of the society.